What is claimed:

1. An isolated nucleic acid molecule selected from the group consisting of: (a) an isolated nucleic acid molecule that encodes the amino acid sequence of SEQ ID No. 2; (b) an isolated nucleic acid molecule that encodes an exon 3-deleted MnSOD; (c) an isolated nucleic acid molecule which comprises SEQ ID No.1; (d) an isolated nucleic acid molecule complementary to SEQ ID No. 1; (e) an isolated nucleic acid molecule that encodes an exon 3-deleted MnSOD and comprises the nucleic acid sequence set forth in SEQ ID NO:3; and (f) an isolated nucleic acid molecule that encodes an exon 3-deleted MnSOD comprising the amino acid sequence set forth in SEQ ID NO:4.

2. An isolated nucleic acid molecule consisting of the sequence of SEQ ID No. 1.

3. The isolated nucleic acid molecule of any of claims 1 or 2, wherein said nucleic acid molecule is operably linked to one or more expression control elements.

4. A vector comprising an isolated nucleic acid molecule of any of claims 1 or 2.

5. A host cell comprising a vector of claim 4.

6. A host cell of claim 5, wherein said host cell is selected from the group consisting of a prokaryotic host cell and a eukaryotic host cell.

7. A method of producing a polypeptide, comprising the step of culturing a host cell transformed or transfected with a nucleic acid molecule of claim 1 or 2

under conditions in which the polypeptide encoded by said nucleic acid molecule is expressed.

8. An isolated polypeptide produced by the method of claim 7.

9. An isolated polypeptide encoded by a nucleic acid molecule of claim 1 or 2.

10. An isolated antibody that specifically binds to a polypeptide of claim 9.

11. An antibody of claim 10, wherein said antibody is a monoclonal or polyclonal antibody.

12. An isolated nucleic acid probe comprising the nucleic acid sequence set forth in SEQ ID NO:3.

13. A method of identifying an agent which modulates the expression of a nucleic acid molecule encoding a polypeptide of claim 9, comprising the steps of:

exposing cells which express the nucleic acid molecule to the agent; and

determining whether the agent modulates the expression of said nucleic acid molecule.

14. A method of identifying an agent which modulates at least one activity of a polypeptide of claim 9, comprising the steps of:

exposing cells which express the polypeptide to the agent; and

determining whether the agent modulates at least one activity of the polypeptide.

15. A method of diagnosing oxidative stress in a cell or tissue sample, comprising the steps of:

(a) exposing the cell or tissue sample to an agent which specifically binds to an mRNA molecule of claim 1; and

(b) determining whether the agent has specifically bound to the nucleic acid molecule, thereby diagnosing oxidative stress in a cell or tissue sample.

16. The method of claim 15, wherein the agent is a nucleic acid probe which specifically binds the nucleic acid molecule.

17. The method of claim 16, wherein the nucleic acid probe comprises the nucleic acid sequence set forth in SEQ ID NO:3.

18. The method of claim 15, wherein the agent is a nucleotide primer.

19. A method of diagnosing oxidative stress in a cell or tissue sample, comprising the steps of:

(a) exposing the cell or tissue sample to an agent which specifically binds to a polypeptide of claim 9; and

(b) determining whether the agent has specifically bound to the cell or tissue sample, thereby diagnosing oxidative stress in a cell or tissue sample.

20. The method of claim 19, wherein the agent is an antibody.

21. The method of claim 20, wherein the antibody specifically binds to the MnSOD exon 2-exon 4 junction in the polypeptide.

22. The method of claim 21, wherein the antibody specifically binds to SEQ ID NO:4.

23. The method of any one of claims 19, 20, 21 or 22, wherein the oxidative stress is associated with a condition selected from the group consisting of necrosis, programmed cell death, damaged mitochondrial constituents, viral replication and infectious agent replication.

24. A method of promoting death or apoptosis of a cell, comprising the step of modulating the level of a nucleic acid molecule of claim 1 in a cell.

25. The method of claim 24, wherein the expression of the nucleic acid molecule is up-regulated.

26. The method of claim 25, wherein the cell is exposed to an expression construct comprising the nucleic acid molecule.

27. A method of inhibiting death or apoptosis of a cell, comprising the step of modulating the level of expression of a nucleic acid molecule of claim 1 in a cell.

28. The method of claim 27, wherein the expression of the nucleic acid molecule is inhibited.

29. The method of claim 28, wherein the expression is inhibited by an antisense nucleic acid molecule.

30. A method of promoting death or apoptosis of a cell, comprising the step of exposing a cell to a polypeptide of claim 9.